

## CLAIMS

## I/WE CLAIM:

1. A method of enhancing images of combined tissue types comprising the steps of:
  - (a) sorting pixels of an image of a combined tissue type into at least two categories of tissue;
  - 5       (b) defining at least two zones encompassing regions of a given tissue type
  - (c) applying an image sharpening filter selectively to only a given one of the two zones; and
  - (d) producing an output image with the given zone modified by the image sharpening filter.
2. The method of claim 1 wherein the image sharpening filter is a spatial high-pass filter.
3. The method of claim 1 wherein the two categories of tissues are bone and soft tissue.
4. The method of claim 1 wherein the given tissue type is bone.
5. The method of claim 1 wherein the two categories of tissues are fat and non-fat tissue.
6. The method of claim 1 wherein the given tissue type is fat.
7. The method of claim 1 further including accepting from a user a sharpening amount input and where the output image in the given zone is a combination of the given zone modified by the image sharpening filter and the given zone unmodified by the image sharpening filter.
8. The method of claim 1 wherein the sharpening amount input is received from a virtual control displayed on a screen showing the output image and wherein the modification of the given zone is performed substantially in real time.

9. The method of claim 1 further including accepting from user a zone modification input modifying the given zone.

10. The method of claim 1 wherein the zone modification input is received by a cursor control device manipulating a zone mask superimposed on the image displayed on a screen.

11. The method of claim 1 including the step of deriving the image from a dual energy x-ray and wherein the sorting pixels determines the tissue type by a comparison of attenuation at the two energies of x-ray.

12. An apparatus for imaging multiple tissue types comprising:  
an x-ray source and detector for collecting x-ray attenuation data over a region of a patient to define pixels of an image;  
a computer receiving the attenuation data and execution of a stored program  
5 to:

- (a) sort pixels of the image into at least two categories of tissue;
- (b) define at least two zones encompassing regions of a given tissue type;
- (c) apply an image sharpening filter selectively to a given one but less  
10 than all of the zones; and
- (d) produce an output image with the given zone modified by the image sharpening filter.

13. The apparatus of claim 12 wherein the image sharpening filter is a spatial high-pass filter.

14. The apparatus of claim 12 wherein the spatial high-pass filter is implemented by subtracting a spatial low pass filtered image from the image.

15. The apparatus of claim 12 wherein the two categories of tissues are bone and soft tissue.

16. The apparatus of claim 12 wherein the given tissue type is bone.

17. The apparatus of claim 12 wherein the two categories of tissues are fat and non-fat tissue.

18. The apparatus of claim 12 wherein the given tissue type is fat.

19. The apparatus of claim 12 further including a user input device accepting from a user a sharpening amount input and wherein the computer program further executes to produce the output image in the given zone as a combination of the given zone modified by the image sharpening filter and the given zone  
5 unmodified by the image sharpening filter.

20. The apparatus of claim 12 wherein the computer program further executes to implement a virtual control on the screen and wherein the sharpening amount input is received from a virtual control and wherein the modification of the given zone is performed substantially in real time.

21. The apparatus of claim 12 further including an input device accepting from a user, a zone modification input modifying the given zone.

22. The apparatus of claim 12 wherein the computer program further executes to implement a painting cursor and wherein the zone modification input is received from the painting cursor manipulating a zone mask superimposed on the image displayed on a screen.

23. The apparatus of claim 12 wherein the x-ray source and x-ray detector produce attenuation data at two energies of x-ray.